MINISTRY OF HEALTH

CENTRAL HEALTH SERVICES COUNCIL

Hospital Laundry Arrangements

Report of the Committee

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CENTRAL HEALTH SERVICES COUNCIL

COMMITTEE ON HOSPITAL LAUNDRY ARRANGEMENTS

INTRODUCTION

TERMS OF REFERENCE

1. At its meeting on the 11th December, 1956, the Central Health Services Council were asked by the Ministry of Health for advice on the best methods of organising the laundering of linen, having regard to the need to avoid infection and to maintain adequate control over the stock of the articles to be laundered. The Council agreed to set up a Committee for this purpose and we were in due course constituted with the following terms of reference:

> " To investigate and report on hospital laundry arrangements with particular regard to the avoidance of infection in the handling of fouled and infected linen, and the maintenance of adequate control over stocks of linen and other articles under such arrangements."

MEMBERSHIP

2. It was with very great regret that during the course of our enquiries we received the resignation of Mr. L. Bird on account of his other commitments. During his service with us, his considerable experience in the laundry field made a valuable contribution to our work. Four officers of the Ministry of Health have been able to attend our meetings from time to time in an advisory capacity and their advice has been greatly appreciated. They were Miss D. J. Berry, Nursing Officer, Dr. C. Grant Nicol, Medical Officer, Mr. C. Haggas and Mr. S. J. Whitaker, Laundry Advisers.

MEETINGS AND VISITS TO HOSPITALS

3. We have met on 10 occasions and members of the Committee have, in pairs, visited some 27 hospitals to investigate the arrangements made for handling and controlling soiled, fouled and infected linen from the bedside to the laundry and back to the ward. The detailed reports of their visits were considered by the whole Committee.

EVIDENCE

4. Written evidence has been submitted by a number of associations and societies with an interest in the problems covered by the Committee's term of reference. These bodies were:

Association of Chief Financial Officers in the Hospital Service in England and Wales.

Association of Hospital Management Committees.
Association of Hospital Matrons.
Association of Hospital and Welfare Administrators.
British Launderers Research Association.
The Confederation of Health Service Employees.
The Institute of British Launderers Ltd.
The Institute of Hospital Administrators.
The Institute of Hospital Engineers.
Joint Tuberculosis Council.
King Edward's Hospital Fund for London.
Medical Research Council.
The Mental Hospital Matrons' Association.
National Association of Hospital Management Committee Group Secretaries.
The Royal College of Midwives.
The Royal College of Nursing.
The Society of Hospital Laundry Managers.
The Wool Textile Delegation.

We have not thought it necessary to invite these Bodies to give verbal evidence.

THE BACKGROUND TO THE PROBLEM

5. The problem of Cross-Infection in Hospitals was under consideration by a Sub-Committee of the Medical Research Council at the beginning of the last war and in 1944 a war memorandum (No. 11) was issued in the hope that some attempt would be made to reduce cross-infection despite the difficulties of war conditions.

6. Subsequently the Sub-Committee became the Committee on Cross-Infection in Hospitals of the Medical Research Council and the war memorandum was revised and re-issued in 1951. It made recommendations for the treatment of infected linen and blankets, including napkins, face masks and handkerchiefs, and also stated that " Soiled linen should never be counted or sorted in the ward or its annexes ". In the same year, the Ministry, in Circular R.H.B. (51) 100, issued Procedural Memoranda for Hospitals and Memoranda on Nursing Procedures, which had been prepared by the Standing Nursing Advisory Committee and approved by the Central Health Services Council. These were concerned with controlling the spread of infection in hospitals.

7. During the same period, the Ministry has also been concerned in securing that proper control is maintained over stocks of linen and blankets, particularly of those items which are of high value. Circular H.M. (54) 45 issued in May, 1954, pointed out to hospital authorities that the prevention of losses of bedding and linen is of special importance, and suggested certain safeguards which might be put into practice. We quote these in full as they have figured largely in our discussions and they indicate the scope of the problem on the control side. They were:

(i) Institution of a central linen and clothing store through which all transfers of linen within the hospital or between the hospital and laundry are effected.

(ii) Application of the " 1 for 1 " principle, i.e., one item to be returned for each replacement issued to wards, etc.

(iii) Central fixing of ward stocks at the lowest practicable level, with arrangements for periodical checking.

(iv) Regular procedure for checking linen sent to and returned from laundries with weekly deficiency lists under the supervision of a senior officer.

(v) Linen cupboards and laundry baskets to be provided with locks and clear instructions to be issued for the locking of cupboards and the safe custody of keys.

(vi) All articles to be marked as property of the hospital or, if preferred, of the Ministry of Health. Interweaving is the most effective method and this should be considered when orders are placed as manufacturers are usually willing to co-operate.

(vii) Issue of instructions placing general responsibility for departmental stocks on Ward Sisters and departmental Heads and discouraging " borrowing " except on the authority of those officers.

8. Thus the control of cross-infection in so far as it is affected hy the use and movement of linen and blankets tends to be at variance with the need to control stocks of those articles in their constant movement from one point of the hospital to another and to outside laundries.

9. It will be observed, therefore, that our terms of reference divide readily into two main sections, i.e., Avoidance of Infection and Control of Linen and other Stocks, and we consider our task from these two aspects in separate sections below. Our general conclusions and recommendations appear in the third section.

SECTION A. AVOIDANCE OF INFECTION

CROSS-INFECTION IN RELATION TO LINEN AND BLANKETS

10. We have found considerable concern in many hospitals about the dangers of cross-infection. Epidemics of staphylococcal infection occur with disconcerting frequency, and all hospitals, whether they have suffered in this respect or not, are anxious to take whatever measures appear likely to diminish the risk of infection.

11. Among hospital activities, that which concerns the handling and cleansing of linen and blankets used by patients seems to have ohvious possibilities of cross-infection. The soiled articles are conveyed from patients who may be infected in some degree, known or unknown, to ward annexes and through the hospital corridors, sometimes via an autoclave or other sterilising apparatus, to a collecting point or to a laundry for washing. Each article may be handled at least once or more often by ward staff, porters and laundry staff and this readily gives rise to a feeling that a potent source of infection is at large throughout the hospital. We have found this feeling, as well as a natural repugnance to handling soiled linen, general throughout the hospitals visited, and it is strongly reflected in all the evidence which we have received.

12. It seems to us that the linen coming from the beds may be grouped into four categories,

(*a*) Soiled linen;
(*b*) Infected linen;
(*c*) Fouled linen, i.e., linen contaminated with excreta or blood;
(*d*) Infected fouled linen, i.e., encountered in quasi-infectious units such as gastro-enteritis units in Children's Hospitals,

each of which needs different treatment at certain stages. We think it is important that hospitals should bear these separate categories in mind when instituting practical measures for dealing with linen.

13. Apart from blankets where the evidence of potentiality for infection is considerable, we have not received any precise evidence except in the case of the smallpox epidemic at Brighton that the handling of soiled or even fouled linen has given rise to cross-infection within the hospital. Enquiries as to whether the incidence of sickness among ward staff or laundry staff handling the linen is greater than among other staff has failed to produce any useful evidence on the point. At the same time the absence of such evidence may be simply due, in part at least, to the lack of sickness records which would reveal such a tendency.

SOILED LINEN AND BLANKETS IN THE WARDS

14. The evidence submitted to us by outside bodies has unanimously favoured the cessation of the sorting and counting of soiled linen in the wards or their annexes. The main reasons adduced were (*a*) the risk of infection to staff and patients, (*b*) the unpleasant nature of the task, (*c*) the inadequacy of the space normally available for sorting and counting, (*d*) economy in the time spent by ward and laundry staff in counting and checking, and (*e*) the frequent inaccuracy of the counting which leads to friction between ward and laundry or linen store. The unpleasant nature of the task was stressed particularly and was felt to add to the difficulty of recruiting and retaining ward staff.

15. These views were generally endorsed by the staff of the hospitals we visited. On several occasions we were particularly disturbed at the unsuitability of the rooms and the very limited amount of space available for counting, which is one cause for the frequency with which inaccurate counts occur and increases the risk of infection. In some hospitals people pass quite close to the places where linen is sorted and have ample opportunities for pilfering.

16. Despite the uncertainty about the provable degree of infection risk which actually arises in wards from the handling of soiled linen and blankets, we are nevertheless firmly of opinion that to minimise this risk no soiled linen or blankets should be counted in hospital wards or annexes. Where the linen has been seriously contaminated by fouling or infection, counting is even more obviously undesirable. Particular problems of disinfection arising in connection with such linen are dealt with below.

17. If soiled linen and blankets, when taken off the beds, are not to be counted in the ward rooms they can be placed immediately into strong washable canvas bags carried on trolleys (the standard two-bag trolley made to B.S.I. specification is suitable) and remain in the bags until they reach the laundry or other appropriate point. The bags or containers should be suitably marked or coloured to indicate for which categories of linen, mentioned in paragraph 12,

they are to be used exclusively. It is suggested that, for the convenience of the people handling laundry, such as nurses and laundry staff, who may move from one hospital to another, there should be a uniform system for marking the bags or containers with coloured stripes. Also, to make it easier for workers who may be colour blind the number of stripes should be varied according to the type of linen in the bags, e.g. Soiled linen, one green stripe, Infected linen, two red stripes, Fouled linen, three blue stripes, Infected Fouled linen, four yellow stripes. For security reasons the bags, when removed from the trolleys, should be closed and fastened with a cord and seal which must only be removed in the sorting room of the hospital or group laundry or in the room where linen is sorted for despatch to a commercial laundry. The porter or other person who collects the sealed bag will give a receipt for the number of bags collected.

FOULED AND INFECTED LINEN

18. As already indicated " Fouled " linen is taken to mean linen which is badly fouled with faeces or blood stains. Fouled linen may vary in quantity from one ward or department to another and in mental deficiency institutions, mental hospitals, and long stay geriatric units may be very substantial indeed. We are firmly of opinion, and so recommend, that the sluicing by hand of fouled linen in wards should cease; all fouled linen should be placed in strong waterproof containers which are clearly identifiable and should be sealed and sent to a central sluicing point. This point should be sufficiently near to the laundry, where the hospital has its own, so that use can be made of the steam and other services, but it should be separate so that sluicing can be operated when the laundry is closed. Where the laundry is situated elsewhere, there should be a central sluicing point in the hospital unless the fouled linen is delivered to a group hospital at least once daily and dealt with promptly.

19. In general hospitals without their own laundries where the amount of fouled linen from each ward is quite small but which in total represents an appreciable problem, the central sluicing point should be situated away from the main ward blocks and equipped with suitable mechanical sluicing equipment.

20. Exceptionally in the mental deficiency institutions and mental hospitals where considerable quantities of foul linen occur daily the sluicing and disinfecting may usefully be undertaken at separate villas near to the wards so as to clear the major fouling quickly, provided a separate room is available with the proper mechanical equipment. Attempts are being made to design machines which will automatically sluice, disinfect and rough dry foul linen to a condition in which it can be passed to the laundry for washing in the ordinary way. These machines can be sited in the ward annexes so that foul linen can be put into them directly from the beds. They have the advantages of doing away with a very unpleasant task and reducing the excessive amount of staff time spent on sluicing. Hospitals intending to introduce these machines should consider carefully which can be used most economically in their particular circumstances. Further research and development appears necessary to find the types and sizes of machines suitable to the circumstances in different hospitals, and to ensure that a satisfactory standard of sluicing and disinfection is reached.

21. Linen known to be *infected* is normally treated with special care in hospital wards and generally speaking it is not counted. This treatment is normally given to linen used for patients with certain types of infectious disease

especially intestinal infection. Linen may carry potentially infective organisms, e.g., staphylococci, in other circumstances and it must be left to the medical staff concerned to decide in what circumstances linen is to be regarded as " infected ". Hospital authorities may wish to lay down their own general rules on this point. Infected linen, immediately on being removed from a bed, should be placed into a container holding a disinfectant solution. The container should not be too large for a nurse to manage. When full and when the linen has been adequately soaked in the disinfectant, the surplus liquid should be decanted and the container sent to the laundry or central sluicing room without the linen being touched again until it reaches its destination. Care should be taken to see that the infected linen is soaked in the disinfectant for a proper length of time. We have noted that the strength of the disinfectant varies greatly from one hospital to another. Some precise advice on this subject is available in the M.R.C. Memorandum Number 11, Appendix A.

22. It has been found that the availability of space and buildings has led to the establishment of group laundries in some infectious diseases hospitals. In such cases every care should be taken to see that soiled linen is at no time in direct contact with infected linen. Where possible infected linen should be disinfected before entering the laundry. Where, as in certain infectious diseases hospitals, linen is received from infectious diseases wards for laundering without prior disinfection, care must be taken that the linen is kept separate from other work. Conversely, where a group laundry in a general hospital receives work from an infectious disease or tuberculosis hospital or unit, this infected linen must be sterilised before entering the laundry (preferably before it leaves that hospital or unit).

23. We have been advised that the War Office have available at stores in several parts of the country mobile laundry units and we understand that they are eminently suitable for use in a hospital in an emergency. Experience during smallpox outbreaks in recent years, has shown the need for a mobile laundry unit to be made available. We suggest that arrangements should be made with the War Office so that one of their units can be obtained in an emergency on request.

BLANKETS

24. The results of tests on woollen blankets have shown that they may harbour a considerable amount of pathogenic organisms and the shaking of blankets tends to scatter these organisms in the environment. We have noted that in most hospitals blankets are changed infrequently and irregularly and may be kept in continuous use for many months. The blankets are, of course, removed when they are soiled or when the patient who has had an infectious complaint leaves hospital, but there does not seem to be any general inclination to exchange blankets regularly even in acute hospitals, the decision often being made according to the visible condition of a blanket at any time.

25. This apparent indifference to the regular cleaning of blankets is no doubt partly due to the fact that they are normally covered by a sheet or counterpane and do not appear to soil as readily as sheets. But it probably derives in larger measure from the difficulty of making the blankets clean or sterile without seriously damaging their quality. Washing blankets at temperatures ordinarily used for woollen materials (100° F.) does not destroy bacteria. Too frequent

washings at high temperature leads to a change of texture and considerable shrinkage. Many hospitals autoclave their blankets when they want to rid them of contaminating organisms, but this results in loss of texture and shrinkage and also sets certain stains the blankets may have.

26. We are aware that a considerable amount of investigation has been carried out by hospital authorities and by manufacturers of antiseptic detergents and of fabrics into methods for obtaining clean and sterile blankets during laundering. These involve the introduction of new compounds into the present washing processes or new washing methods. In addition it has been suggested that the use of a certain type of continuous drier with a temperature rising to 240° F. may be effective in destroying bacteria without damaging the fabric of the blanket. These processes are, in many cases, in an experimental stage. Until more is known of their value and as a safeguard against human error we consider that two or more methods should be used.

27. We are of opinion that more interest needs to be taken in the part the woollen blanket plays in the problem of cross-infection and more controlled and systematic tests should be undertaken by hospital pathologists to ascertain the degree of risk that exists in their hospitals. Further, the work being done by manufacturers to produce disinfectant agents should be tested with some degree of priority and the results published, so that hospitals may benefit from the new advances as rapidly as possible. Moreover, investigations are now going on into the use for blankets of materials other than wool which can be boiled without loss of quality.

BABIES WOOLLENS, LINEN AND NAPKINS

28. In many hospitals babies' linen and garments are often washed on the wards, in order to ensure that special care is given to them. Special napkin services either in the hospital laundry or by commercial firms are said to be satisfactory where (i) the napkins are returned within 24 hours, (ii) they are sterilised before leaving the laundry, (iii) special care is given to the napkins, and (iv) sluicing on the ward is not required.

29. We believe it to be undesirable that any soiled linen should be washed in the ward annexes by ward staff, but in view of the nature of the linen, etc., coming from the babies' wards and the risk of infection we think there is advantage in having a separate department to deal with babies' garments and soiled napkins. Babies' woolly garments need to be treated with particular care if they are to remain in good condition and we consider that special napkin services are to be encouraged though in this case the use of destructible napkins might be seriously considered.

30. Babies' blankets not only carry a risk of infection but the fluff from them may get under the babies' nails and so may help to initiate infection of the skin and eyes. Some hospitals have overcome this by enclosing the blankets in a cotton envelope which can be washed separately. We commend this arrangement, but we are not in favour of extending it to the blankets used on adult beds in the maternity wards. Moreover it is not meant to obviate the regular washing of babies' blankets.

TRANSPORT OF LINEN, ETC., TO AND FROM LAUNDRY

31. Soiled linen should be transported away from the wards as soon and as regularly as possible on general hygienic grounds. The longer the sealed bags

remain in ward annexes or corridors where staff are constantly passing, the greater the risk of infection. The frequency of collection is a matter for local arrangement but hospitals should give attention to providing suitable places in which the hags of soiled linen can be kept and to making frequent collections therefrom.

32. Wherever possible the soiled linen should not be transported along the main corridors or in the lifts used by patients or by food trolleys. The trolleys used for conveying the soiled linen should not be used for carrying food or stores of any kind. Where chutes are used to deliver the hags to a collecting room, care should be taken to see that the chutes are properly cleaned and ventilated.

33. The use of wicker baskets for the transport of clean linen back to the hospitals or wards is considered to be unsatisfactory. Dust easily penetrates the wicker, which is very difficult to disinfect properly. Wicker baskets will clearly continue in use for some time to come, and we recommend the use of a washahle or disposable liner to the baskets or containers, such as calico or tissue paper. It is understood that some manufacturers are giving attention to this prohlem. The hags which hring the soiled linen should be washed hefore being returned.

34. The use of square containers made of heavy duck material for clean linen is heing tried in some hospitals, hut further experiments appear necessary to find a really satisfactory way of returning clean linen to the wards without the fear of contamination on the way.

35. Any vans used for transporting soiled linen or clean linen to and from the laundry should be capahle of being thoroughly cleaned and disinfected after each journey. When trolleys are used for soiled linen, they too should be disinfected after each journey. Containers of clean linen must, of course, be kept dry and especially, rest on a dry surface during transit.

HOSPITAL LAUNDRIES

36. The question of the reception and sorting of soiled linen in the laundry is dealt with in Section B, hut with regard to the elimination of infection from the soiled linen, we feel that, as with the hlankets, much turns on the efficacy of the washing methods used and the suhsequent processes and of certain drying methods. We are aware of efforts hy manufacturers to produce hetter sterilising and cleaning agents but we have not considered it to be part of our terms of reference to initiate researches into their value. We refer generally to the question of research later in this section.

37. It appears to us that insufficient attention is paid to the prevention of possihle infection arising from the movement of staff from the soiled linen side of the laundry to the clean side. We found, for instance, that frequently the staff in a laundry moved freely from one part to another without taking proper precautions against the spread of infection. In particular, sorting staff may continue to use the same overalls when they go on to clean work and even where there is a rule about changing overalls the female staff often wear the same type of overalls so that there is no means of checking readily whether they ohey the rule. Workers handling dirty linen and those working on the " Dirty " side of the laundry should wear overalls of a distinctive colour and should he ohliged to remove or change their overalls and wash their hands when leaving the dirty side either for the canteen or to work on the clean side.

38. We recommend that laundry staff handling soiled, fouled or infected linen should be provided with head covering, rubber gloves, overalls and ruhber boots, and masks in tuberculosis hospitals. Plastic overalls should be provided when handling wet soiled work. The staff should be required to remove these when transferring to work in other parts of the laundry and the overalls should be of a distinctive colour so that they can be easily recognised should they be worn wrongly outside the sorting room. The overalls should be of the type which cover the wearer up to the neck, and fasten at the hack. In no circumstances should laundry workers go to the canteen or common rooms or outside the laundry in the protective clothing worn in the sorting room.

39. Washing facilities should be immediately at hand for sorting staff, and for all laundry staff it is essential that adequate toilet and cloakroom accommodation should be provided. Cloakrooms are particularly necessary so that personal belongings can be deposited there before staff enter the laundry. The cloakrooms need to he carefully supervised as this is the point in the laundry where pilfering most readily occurs. Adequate canteen facilities are also essential if staff are not to eat food at their work stations.

HEALTH OF LAUNDRY STAFF

40. Laundry workers, and particularly those handling soiled and infected linen are subject to a risk of infection and they should receive training in safety precautions. All laundry workers should receive a medical examination including a tuberculin test and X-ray of chest on commencing work; those giving negative tuherculin reaction should be offered B.C.G. vaccination and all staff should be X-rayed at regular intervals. Vaccination (including re-vaccination) against smallpox should be offered to all laundry staff. They should also be required to report infections such as gastro-intestinal infections, septic fingers and boils and should not he permitted to work in the laundry while so affected.

PLANNING OF HOSPITAL LAUNDRIES

41. Hospital laundries vary greatly in size, lay-out and efficiency, and a continuous process of centralisation, re-organisation and development is going on throughout the country. In planning the lay-out of new or old laundries we urge that every endeavour should be made to separate completely the soiled linen side from the clean side.

CO-ORDINATION OF RESEARCH

42. We have referred in several paragraphs to research which is needed or is being done into matters of different kinds which are within the terms of reference of the Committee. We noted in the course of our visits that experiments had been made in a number of hospitals to ascertain the extent of cross-infection arising from the handling of soiled linen and hlankets, and into the effectiveness of detergents and washing processes. In some the experiments were not always carried out under properly controlled conditions and the results achieved were frequently huried in the hospital archives. Much useful research is being done and we strongly recommend that hospital authorities should be encouraged to send in the results of such work and that arrangements should be made without delay to co-ordinate all this research and make the information availahle to hospitals. We urge the Minister of Health to initiate action to this end.

SECTION B. CONTROL OVER STOCKS OF LINEN AND OTHER ARTICLES

INTRODUCTION

43. Throughout our deliberations, we have become increasingly conscious of the fact that the control of linen and allied articles in hospitals is a complex problem in itself, apart entirely from special difficulties created by the need to minimise the danger of cross-infection. Its complexity derives from several causes. First, most of the articles can be used in ordinary domestic life which makes them more prone to pilfering than other hospital assets. Second, linen is constantly circulating round the hospital, and changing hands several times in the process, so offering more opportunity for losses to occur than would otherwise be the case. Third, the number and variety of articles so circulating each day—in a 400 bedded acute hospital say 4,000 soiled and a similar number of clean—makes accurate physical control virtually impossible.

The present official system is based on a technique of control which fundamentally is only appropriate to articles which have comparatively little movement. It does not, in any effective way, deal with these inherent difficulties of linen control.

PRESENT SYSTEM

44. The Minister has, under the general powers given to him by paragraph 23 of the National Health Service (Hospital Accounts and Financial Provisions) Regulations, 1948, (S.I. 1414), required Hospital Authorities to compile inventories of linen held. Further, in order to ascertain as nearly as possible where losses have taken place, he has stated (R.H.B. (50) 17/H.M.C. (50) 17/B.G. (50) 15) that responsibility for inventories should rest on heads of departments, ward sisters, etc., who would have the custody of the inventories and would check them at regular intervals. A further circular H.M. (54) 45 stated that a serious view would be taken of any loss found to be due either to lack of instructions placing general responsibility for departmental stocks on ward sisters and departmental heads, or to the lack of regular procedure for checking linen sent to and returned from laundries with weekly deficiency lists under the supervision of a senior officer.

45. At the same time, H.M. (54) 45 detailed other procedures in the nature of general controls, namely, the setting up of central linen stores on a one-for-one exchange basis through which all movements of linen should be effected; the reduction of ward stocks to the lowest practical level and their periodical checking; security arrangements in regard to linen cupboards and baskets; and appropriate marking or interweaving.

46. The maintenance and checking of departmental inventories under the official scheme is a task of considerable dimensions. It demands the counting and recording, by or on behalf of the departmental head, of all linen sent to the laundry, the central linen room, the sewing room or any other destination; it requires similar counting and recording of linen returned; and it involves corresponding counts by the departments with whom the transactions have taken

place. It entails the maintaining by each department of a cumulative record of linen " owing ", since rarely is linen returned in batches exactly corresponding to those sent. The system further demands periodical checks of linen with the departmental inventories both by the departmental heads and by independent officers, involving the counting of linen in use and in linen cupboards, and the making of adjustments for linen in transit.

REASON FOR PRESENT SYSTEM

47. When the present official system was evolved, the greater part of the linen in most hospitals was contained in individual wards and departments. Each was allocated a stock, individually marked, to cover its maximum requirements so that recourse to the general linen store was only necessary for the replacement of condemned articles or losses. This basic stock had to be sufficient to cover the longest period during which the laundry was ever likely to be closed (e.g. four days at Easter) plus the normal laundry turnover time. In short, each ward had, permanently, sufficient stock to cover something like a week's requirements for every bed provided. With such quantities of linen held at so many points in the hospital, we think that something very like the official system was inevitable.

OBJECTIONS TO PRESENT SYSTEM

48. Arithmetical errors are unavoidable even in the counting of clean linen, particularly when large stocks are held; errors will also be made in classification or terminology. In none of these cases can any satisfaction be gained from trying to hold sorting staff personally responsible for such inaccuracies. Much greater is the degree of error when soiled linen is being dealt with. Furthermore, fouled or infected linen is, in many hospitals, laundered without prior checking. This, of itself, destroys the value of other checks made, for if any portion of the linen is not checked, the count of the remainder is useless.

49. From all the evidence submitted to us, it seems certain that rarely are any of these many counts and checks accurate and often discrepancies between ward and laundry are not cleared up, with the result that differences disclosed when the inventory is checked are inevitably suspect. They may, indeed, represent losses, but they may also very well be due to errors such as we have described. It is a commonplace, for instance, for inventories to disclose surpluses, and for a deficiency at one check to become a surplus at the next. In short, the results of any inventory check are so uncertain that action cannot be taken until still more work has been undertaken in the hope of establishing whether the differences disclosed are in fact losses.

In their evidence, the Association of Chief Financial Officers in the Hospital Service in England and Wales say:—

> " There seems to us, then, to be a " prima facie " case for the view that much time and effort which could well be utilised elsewhere is being devoted to the maintenance of a system—theoretically perfect—which gives only approximate results; involves additional work in trying to trace non-existent losses; and, of itself, can rarely disclose the cause of the loss or indicate who is to blame or how to avoid a recurrence."

50. The present system then has placed its main emphasis on departmental inventories and attempted to fix responsibility at that point. We agree that the principle of departmental responsibility is unexceptionable in theory, but we

have no douht that, in the case of linen, it cannot be achieved in practice. In the last resort, responsibility in this sense must imply being subject to disciplinary action. Departmental heads cannot evade a high degree of responsibility for the safeguarding of the property in their care, hut as we have pointed out linen is not susceptible of accurate detailed control. Further, except for palpahle administrative slackness, disciplinary action could surely never be taken against a departmental head who is not in exclusive control for the whole of the twenty-four hours of the day.

51. Our examination of the present official system of control leaves us in no doubt that it has not achieved its declared objects, that it no longer commands the confidence of any branch of the Service, and that even in the most favourable circumstances it is uneconomic. We consider that its continuance would be merely paying lip service to those principles of public accountahility which it is designed to protect. The control of linen in the future should be hased on a more realistic policy involving the deliberate acceptance of the risk of minor losses, hut placing a greater emphasis on the prevention of loss hy methods of physical control.

A FRESH APPROACH

52. In paragraph 60 we refer in detail to what we regard as the essential physical controls. Of these, the most effective is the reduction of linen holdings, and this has been constantly emphasised hy the Minister. We are satisfied that a point can be reached in this process where the opportunities for pilfering are so circumscribed and the quantities so small that the cost of estahlishing ward and departmental losses is not worth while. In this connection we have noted a development in the central linen room system which has considerahly simplified the problem of linen control. In certain hospitals, wards and departments no longer hold an imprest stock which is exchanged on a one-for-one basis, but indent daily for their requirements for the next 24 hours. Under this system only at week-ends or holiday periods do departmental stocks need to exceed one day's requirements. We have no doubt that where this is achieved the maintenance of ward and departmental inventories can be safely abandoned.

No count of soiled linen would therefore be made in wards or departments, but we recommend that clean linen should be counted on its receipt, both as a check on the linen room and to emphasise to the staff concerned, the continued need for its close supervision.

53. Although we have recommended the discontinuance of the ward inventory system where ward stocks are reduced to one day's requirements, we do not therehy imply that a higher level of ward stocks should necessarily require the present system to be maintained. We consider that every effort should be made in all hospitals to reduce ward stocks to the minimum practicable and that, of those which cannot achieve a single day's stock, a fairly large selection might be permitted, for an experimental period, to discontinue the present inventory procedure.

54. We shall refer later in more detail to the Central Linen Room. At this point we would emphasise that where ward and departmental inventories are ahandoned, the Central Linen Room becomes the corner-stone of the system of control. Stocks elsewhere having been reduced to the minimum, all reserve holdings of linen in circulation will be kept in the Central Linen Room. It should

have the lowest practicable stocks consistent with avoiding on the one hand too ready an application to the general stores for an increase, and, on the other, the permanent holding of articles surplus to requirements for the longest Bank holiday week-end. The Linen Room supervisor should query with a senior nursing officer any abnormal variations in the daily indents from wards or departments, and should keep a close watch on the level of stocks held in the Central Linen Room.

Requests from the Central Linen Room for additional linen in excess of articles condemned are, unless there has been a change of circumstances, prima facie evidence that losses have heen incurred. In the latter case, all such requests, therefore, should be the subject of immediate administrative enquiry. It will be realised that the lower the Central Linen Room imprest the sooner will such losses he revealed.

55. The next consideration is whether soiled linen should be counted at all. In theory, such a count serves primarily to localise losses. We have already argued, in the case of wards and departments, that a radical reduction in stocks held justifies the abandonment of their inventories, and, hence, a cessation of the soiled linen count at that level.

The problem elsewhere—which, in effect, means in the laundry—is different in that, despite the reduction in ward stocks, the turnover of linen (and, therefore, the opportunities for pilfering) would remain unchanged. We recognise that since soiled linen must be handled before laundering in order to sort it for the different washing processes, counting would add little to the risk of infection. Nevertheless, such a count would inevitably suffer from the inherent inaccuracies already referred to, and from the fact that fouled and infected linen is frequently laundered without any prior check. The general opinion appears to be that losses in laundries are small, and despite the lack of precise evidence on this point we cannot avoid the conclusion that the additional control achieved by counting soiled linen in the laundry is largely hypothetical. We believe it does not disclose petty pilfering, hut losses can at least as readily be prevented by the stringent application of physical controls, and that its discontinuance would result in economies.

Clean linen would have to be counted before leaving the laundry to provide statistics of output, and as a check on the linen room.

56. Our proposals for the abandonment of ward and departmental linen inventories in appropriate circumstances and for the cessation of all counting of soiled linen do, at the same time, reduce the possihilities of cross-infection. We emphasize, nevertheless, that this is quite fortuitous. Where the abolition of the ward inventory is not considered practicable, then the counting of soiled linen if continued at all must he carried out at some central collecting point removed from the ward.

57. There is, however, one aspect of the prohlem which needs special consideration, namely, where a laundry serves more than one hospital. If the counting of soiled linen he retained, then such a count would he needed at both sending and receiving hospitals. It would, however, give rise to the sort of discrepancies we have already described, and would neither resolve the differences nor control the pilfering. On the other hand, if soiled linen counting be abolished, then no-one could ever be sure whether losses discovered in any of the participating hospitals had arisen within their own several curtilages or in the joint laundry. We do not

think that this consideration would, in practice, be important. We consider, too, that the possible economies are such that it would be worthwhile, as a matter of experiment in selected hospitals using individually marked linen and covered by joint laundries, to abolish the soiled linen count. The final decision on the principle could await the result of the experiments.

58. Logically it is difficult to resist the conclusion that this argument might be equally applicable to transactions with commercial laundries. We feel, however, there is an important distinction in that, in this case, the linen will leave the possession of hospital authorities who will not be able to ensure that security arrangements are at all times adequate. We therefore feel that the extension of this proposal to commercial laundries should await the result of the experiments we have suggested in the case of joint-user laundries.

CENTRAL LINEN ROOM

59. (i) We consider that Central Linen Rooms are of value in their own right, apart from their special place in the system we have now recommended. They should result in smaller total stocks of linen, and sorting time is greatly diminished in that a sort over wards and departments is no longer necessary.

(ii) The control exercised here is the keystone to the system of control as a whole, and the first condition of its success is adequate supervisory and clerical staff.

(iii) Local circumstances must generally decide its situation, although we think there are certain advantages in its being contiguous to, even part of, the laundry where there is one.

(iv) It is a matter for local administration to state who is in charge Even where it forms part of the laundry building, we think there can be two views and, indeed, we have seen such a Central Linen Room which operates quite satisfactorily without being under the control of the laundry manager.

(v) The records should be on a stores basis, covering receipts of linen from the laundry and from the general stores, and issues to wards and departments.

(vi) No requisitions on the general store for quantities in excess of items condemned under the authorised procedure should be met without enquiry into the reasons, for such a requisition could be a " prima facie " indication of losses. (See also para. 54.)

(vii) It should be subjected to normal stores' checks.

SECURITY MEASURES

60. With the relaxations we are proposing, we consider that even greater attention should be directed to:

(*a*) The reduction of linen holdings everywhere to the minimum.

(*b*) The locking of stock rooms and the restriction of the number of persons having access to them.

(*c*) The cording and sealing of containers during transit and the insistence on receipts, at each change of hands, for the number of containers.

(*d*) Constant and positive supervision by all staff having linen in their charge.

(*e*) The use of the best and most up-to-date marking and interweaving procedures.

(*f*) Frequent, systematic and accurate condemning procedures.

We think, too, that an extension of the practice of employing Security Officers might be useful. We believe that, in any really effective system, the right of search is implicit, but we can well understand that such a policy might lead to difficulties. Whether or not a Security Officer is employed, hospital authorities should report to the police circumstances attending any special loss or the finding of staff in unauthorised possession of hospital property. The staff should, of course, be made aware of this rule.

ALTERNATIVE SYSTEMS

61. We are aware that many hospitals, from lack of accommodation, will be unable to establish a Central Linen Room in the way we have suggested and that, in other cases it may be inappropriate or otherwise impracticable to do so. At this point, we would question the assumption that there must be a single system obligatory on all hospitals and in all conditions. We believe that, quite apart from the different methods of organizing the supply of linen, there are different problems in the various types of hospital and different circumstances in hospitals of the same type. We consider that the control of linen, in the Service as a whole, would be more effectively dealt with by there being a variety of "approved" systems and also machinery for the approval of any satisfactory variation from the official ones. Besides producing a more effective solution to the purely technical problem, this would, we think, avoid that rigidity which must be a bar to progress and would encourage active research into better methods.

SECTION C. SUMMARY OF RECOMMENDATIONS

62. As has been indicated earlier in this report our terms of reference raised two main issues, i.e., the avoidance of infection and the control over stocks of linen and other articles. In Sections A and B respectively we have considered how to resolve these two issues and have reached certain conclusions under each head.

63. In this concluding section we seek to bring together these suggestions into firm recommendations which we believe will have regard to the conflicting interest which arise on both sides, and to provide a workable solution to the problems posed.

RECOMMENDATIONS

64. (A) We are firmly of opinion that the cessation of the counting of soiled linen in the wards and departments is desirable in itself, and is of such importance in the avoidance of infection that all hospitals should review their arrangements as soon as possible to see in what ways the other recommendations which we make can be brought into effect so as to enable the counting in the wards and departments to be stopped.

(B) In the light of the above and given the proper exercise of the general methods of control detailed in paragraph 60, together with the control in the Central Linen Room described in paragraph 54, we consider that the present official system of control can he progressively relaxed, on the following lines:

(i) *Ward and Departmental Inventories:*

(*a*) Where ward stocks are reduced to a single day's requirements, the ward and departmental inventories should be abandoned. (Paragraph 52.)

(*b*) Where these conditions cannot be fulfilled for particular reasons, a large cross-section should be permitted, as an experiment, to discontinue the ward inventory system. On the results of such experiments—i.e. the change in the scale of losses disclosed—would depend their continuance and their extension to other hospitals. (Paragraph 53.)

(ii)

(*a*) Where a hospital is permitted under either (B) (i) (*a*) or (*b*) above to discontinue ward inventories, it should also, provided it enjoys the exclusive use of its own laundry, be allowed to ahandon all counting of soiled linen. (Paragraph 55.)

(*b*) Where hospitals are permitted under (B) (i) (*a*) or (*b*) above to discontinue ward inventories but do not enjoy the exclusive use of their own laundries, or where they send soiled linen to other hospital laundries, a large selection of them, if not all, provided their linen is suitahly marked should be permitted on an experimental basis to discontinue the counting of soiled linen. (Paragraph 57.) In the case of commercial laundries, however, we feel that a similar relaxation of control should he deferred. (Paragraph 58.)

(iii) *Total Hospital Linen Inventory:*

We think it prohable that the experiments we propose will show that hospital linen can be dealt with both economically and satisfactorily by treating it as " consumahle stores " and relying for its control mainly on physical and administrative, as opposed to accounting, methods. In other words no total linen inventory would be maintained and accounting methods would be confined to linen stores records in the general stores and the Central Linen Room. We consider that this should be tried experimentally with those hospitals which conform to the conditions in (B) (i) (*a*) above.

(C) In those hospitals where the recommendations in (B) (i) are not applied we propose that the counting of the soiled linen should be done away from the wards in some central collecting point (paragraph 56).

(D) Where the recommendations in (B) (i) are applied the soiled linen should, when taken off the beds be placed immediately into containers which should be suitably marked or coloured to indicate the type of linen inside and each container should be firmly sealed before despatch; the seal must not be broken until the container reaches the appropriate point at which it is opened (paragraph 17).

(E) " Fouled " linen should not be sluiced on the wards but at a central sluicing point (paragraph 18 and 19; but see also paragraph 20).

(F) The more frequent use of machines which will automatically sluice, disinfect and rough dry foul linen ready for washing in the ordinary processes should be considered (paragraph 19).

(G) Care should be taken to see that infected linen is properly disinfected; advice on the strength and use of disinfectants for this purpose should be issued (paragraph 21); in grouped laundry arrangements linen from infectious sources should be kept separate from other work (paragraph 22).

(H) Mobile laundry units used by the War Office are available for emergency use in hospitals, i.e. for smallpox outbreaks (paragrapb 23).

(I) Greater interest needs to be taken in

(i) the part blankets play in cross-infection;

(ii) the efforts being made to evolve more effective disinfectants for blankets and tbe rapid dissemination of information on the subject, and

(iii) use of alternative materials for blankets (paragraphs 24 to 27).

(J) Special consideration needs to be given to the washing of babies' woollens, linen and napkins (paragrapb 28 to 30).

(K) Soiled linen should be transported from the wards as frequently as possible (paragraph 31); main corridors and patients lifts should be avoided and food trolleys should not be used; cbutes used for soiled linen should be properly cleaned and ventilated (paragraph 32); experiments are needed for tbe prevention of contamination of clean linen by dust through using wicker baskets paragraphs 33 and 34); vans should be thoroughly disinfected (paragraph 35).

(L) The only count which should be made in the laundry of a hospital operating under the recommendations in (B) (i) above is that of tbe clean linen (paragraph 55); where soiled linen is sent to a group laundry situated in another hospital, a count should be made, but experimentally the count should be abolished in selected hospitals (paragraph 57); until these experiments show favourable results soiled linen sent to commercial laundries should continue to be counted (paragraph 58).

(M) Precautions should be taken to prevent possible infection arising from the movement of sorting staff from the sorting room to other parts of the laundry or into canteens etc.; laundry staff should be provided with adequate protective clothing, washing facilities and cloakroom accommodation (paragraphs 37 to 39).

(N) The health of laundry workers should be safeguarded by preventive measures, training and medical examinations, including X-ray of chest, vaccination etc. (paragraph 40).

(O) In the planning of hospital laundries the aim should be to separate the soiled side completely from the clean side (paragraph 41).

(P) Much research into problems of infection, washing processes, alternative materials, etc. is being done in hospitals, among manufacturers and elsewhere, and an effort should be made to co-ordinate research, particularly that being done in hospitals, and to make available to hospitals the information obtained (paragraph 42).

65. Finally we wish to express our appreciation of the work done by our Secretary, Mr. R. C. J. Kenrick, who has been most helpful in every way.

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